

**REMARKS**

Reconsideration of the subject application is respectfully requested in light of the amendments above and the comments which follow.

Claims 1-21 are pending in this application. Claims 1-4 and 16 have been withdrawn from consideration.

CLAIM REJECTIONS UNDER 35 U.S.C. §102(b)

Claims 5, 7-17 and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ljungberg et al. (U.S. 5,683,640) on the grounds set forth at paragraph 4 of the Official Action. Claims 5, 7, 11, 15, 16 and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ljungberg et al. (U.S. 5,487,625) on the grounds set forth at paragraph 5 of the Official Action. Claims 5, 6, 11, 15, 16 and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ljungberg et al. (U.S. 5,766,782) or Van Den Berg et al. (U.S. 5,516,588) or Goedicke et al. (U.S. 5,698,314) on the grounds set forth at paragraph 6 of the Official Action. Each of these anticipatory rejections is traversed because each of the references does not disclose the cutting tool as presently claimed.

Claim 5, the only independent claim rejected here, recites that a cutting tool comprises a hard a wear resistant coating comprising at least one layer consisting essentially of crystalline α -Al₂O₃. The layer has a thickness of from about 0.5 to about 10 μ m and columnar grains with an average grain width of from about 0.1 to about 1.1

μm, where the layer is deposited by chemical vapor deposition at a temperature of from about 625 to about 800 °C.

None of the cited references discloses all of the features of claim 5. The below table summarizes the disclosure in the cited references with respect to Al₂O₃ deposition method and Al₂O₃ deposition temperature:

Cited Ref	Al ₂ O ₃ deposition method	Al ₂ O ₃ deposition temp
USP 5,487,625	CVD	about 1000° C (col. 2, line 41)
USP 5,516,588	Plasma activated CVD	400° to 750° C (abstract)
USP 5,698,314	PVD (Magnetron Sputtering)	600° C to 800° C
USP 5,766,782	CVD	Between 850° - 1100° C (col. 3, line 10)
USP 5,851,687	CVD	About 850° C to 1100° C (col. 2, line 49)
USP 5,863,640	According to SE 501527 (USP '625)	See above
	According to SE 9304283-6 (USP '687)	See above
	According to SE 9400089-0 (USP '782)	See above

First, and as seen above, USP '625; USP '782, USP '687 and USP '640 each form a coating by depositing at a temperature different from the coating of the claimed cutting tool. This is not a insignificant difference. The temperature of deposition is significant to the properties of the coating on the cutting tool. For example and as disclosed in the application at, for example, para. [0054], depositing Al₂O₃ by the CVD process at the claimed temperature range produces a coating with 20% to 150% improvement in toughness while maintaining flake resistance properties (see, para. [0057]) in comparison to depositing at a higher temperature.

Thus, for at least USP '625; USP '782, USP '687 and USP '640 the claims are quite different from the disclosure in the prior art. Thus, an anticipatory rejection is improper because coatings at the lower temperature exhibit better toughness and edge flaking properties than those alumina layers deposited at a higher temperature. Accordingly, reconsideration and withdrawal of the rejections based on these references are respectfully requested.

Second, the claimed cutting tool has a coating formed by CVD, while USP '314 deposits by PVD and USP '588 deposits by plasma activated CVD (PACVD). Each of these deposition methods produces differences in the coating.

For example, depositing by CVD as claimed produces a stress state in the coating that is different from the stress state formed under PVD (the deposition process disclosed in USP '314). Namely, CVD processes produce tensile stresses while PVD processes produce compressive stresses. The difference between tensile stress and compressive stress impacts the properties of the coating, by, for example, improving adhesion and thus resistance to flaking.

Also for example, depositing by CVD produces different grain sizes and different stresses in the coating as compared to depositing by PACVD. Thus, the CVD deposited coating produces grains of from 0.1 to 1.1 μm average grain width while PACVD produces grain sizes of 20 nm or less (see abstract of enclosed Ch. Taschner et al., Deposition of hard crystalline Al_2O_3 coatings by pulsed d.c. PACVD, Surface and Coatings Technology, 116-119 (1999) 891-897.). Further, CVD produces tensile stresses while PACVD produces compressive stresses. Indeed, Ch. Taschner et al.

itself notes that thermal CVD processes produce different crystallized surfaces and roughness as compared to PACVD (see abstract).

Thus, for at least USP '314 and USP '588 the claims are quite different from the disclosure in the prior art such that an anticipatory rejection is improper because coatings by CVD are different from those of PCD and PACVD in at least one of grain size and stresses. Accordingly, reconsideration and withdrawal of the rejections based on these references are respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 6 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ljungberg et al. (U.S. 5,766,782) or (U.S. 5,487,625) on the grounds set forth at paragraph 8 of the Official Action. Claims 6, 20 and 21 stand rejected under 35 U.S.C. § 103(a) as being anticipated by Ljungberg et al. (U.S. 5,863,640) on the grounds set forth at paragraph 9 of the Official Action. The rejections based on USP '782, USP '625 or USP '640 do not constitute a prima facie case of obviousness because the CVD process at the elevated temperatures above the claimed range produce different coatings from that of the coating in the claimed tool that is deposited at about 625 to about 800°C.

For example and as noted above both in the table and in the arguments, coatings at the lower temperature exhibit better toughness and edge flaking properties than those alumina layers deposited at a higher temperature. There has not been established any motivation or likelihood of success to support modification of the

references and, therefore, the reference does not disclose, teach, or suggest the present claims. For at least this reason, the rejection is an improper obviousness rejection and reconsideration and withdrawal are respectfully requested.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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